

38. The multilayer substrate recited in claim 31, wherein the capacitor comprises a plurality of high permittivity layers.

39. The multilayer substrate recited in claim 38, wherein the capacitor comprises a plurality of conductive layers interleaved with the high permittivity layers, such that alternating conductive layers are coupled to the first and second lands, respectively.

40. The multilayer substrate recited in claim 31, wherein the organic portion comprises a plurality of layers, each comprising a portion of the plurality of conductors.

REMARKS

Applicants have carefully reviewed and considered the Office Action mailed on May 8, 2002, and the references cited therewith.

Claims 3, 5-6, 28 and 30 are amended, no claims are canceled, and claims 31-40 are added. As a result, claims 1-10 and 28-40 are now pending in this application.

Amendments to Claims 3, 5-6, 28, and 30

Original claims 3, 5-6, 28 and 30 have been amended. No new matter has been introduced. The amendments to the claims are made for the purpose of clarification, and they are not intended to limit the scope of equivalents to which any claim element may be entitled.

In claims 3 and 5, "portion" has been substituted for "layer".

In claim 6, "underlying" has been substituted for "subjacent". Support may be found in FIG. 3 and the associated text of the specification. Also, "ceramic" has been deleted.

In claim 28, the "at least one capacitor" is now recited as being located between upper and lower surfaces of the "first portion of the substrate". Also, the "second portion" is now recited as "overlying the first portion". Support may be found in FIG. 3 and the associated text of the specification.

In claim 30, the “second plurality of lands” are now recited as being formed on the “lower surface of the first portion of the substrate”. Support may be found in FIG. 3 and the associated text of the specification.

New Claims 31-40

New claims 31-40 have been added to provide Applicants with additional protection to which Applicants are entitled. No new matter has been introduced.

Independent claim 31 is similar to independent claim 1 and recites inter alia a capacitor located between the upper and lower surfaces of a ceramic portion of the substrate.

Dependent claims 32-40 are similar to dependent claims 2-10, respectively.

For the convenience of the Examiner, Applicants’ remarks concerning the claims will be presented in the same order in which the Examiner presented them in the Office Action.

Rejection of Claims 1 and 10 Under 35 U.S.C. §102(e) as Anticipated by Fukuoka

Claims 1 and 10 were rejected under 35 U.S.C. §102(e) as being anticipated by Fukuoka (U.S. Patent No. 5,949,654).

Fukuoka discloses a multi-chip module (450, FIG. 13) having a passive element 411 mounted on the upper surface of a ceramic-based multi-layered wiring board 408k overlying a thin film multi-layered wiring board 408j.

Fukuoka fails to disclose the structure recited in claim 1. Among other things, Fukuoka fail to disclose an “embedded capacitor”. Applicants’ capacitor is embedded between the upper and lower surfaces of the ceramic portion (90, FIG. 3). By positioning an embedded capacitor very close to the die (60, FIG. 3), inductance and other power delivery problems can be reduced.

For the above reasons, claim 1 should be found to be allowable over Fukuoka, and Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §102(e) as anticipated by Fukuoka be withdrawn.

Claim 10, which depends from claim 1 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above.

Rejection of Claims 7-9 Under 35 U.S.C. §103(a)
as Unpatentable Over Fukuoka

Claims 7-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fukuoka (U.S. Patent No. 5,949,654).

Applicants respectfully assert that the Examiner has not established a prima facie case of obviousness, because Fukuoka does not teach or suggest all of the claim limitations. Among others, Fukuoka fails to disclose an “embedded capacitor”, as mentioned above regarding the rejection of claims 1 and 10 under 35 U.S.C. §102(e).

For the above reasons, claims 7-9 should be found to be allowable over Fukuoka, and Applicants respectfully request that the rejection of claims 7-9 under 35 U.S.C. §103(a) as unpatentable over Fukuoka be withdrawn.

Rejection of Claims 2-6 and 28-30 Under 35 U.S.C. §103(a)
as Unpatentable Over Fukuoka in View of Gregor

Claims 2-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fukuoka (U.S. Patent No. 5,949,654) in view of Gregor et al. (U.S. Patent No. 5,354,955).

Fukuoka was discussed previously.

Gregor discloses an interposer (12, FIG. 1) coupled to an underlying multi-chip module 10 via solder bumps 20. Gregor does not appear to mention any capacitor.

Applicants respectfully assert that the Examiner has not established a prima facie case of obviousness, because the combination of Fukuoka and Gregor do not teach or suggest all of the claim limitations. Among others, the combination of references fails to disclose an “embedded capacitor”, as mentioned above regarding the rejection of claims 1 and 10 under 35 U.S.C. §102(e).

For the above reasons, claims 2-6 should be found to be allowable over Fukuoka in view of Gregor, and Applicants respectfully request that the rejection of claims 2-6 under 35 U.S.C. §103(a) as unpatentable over Fukuoka in view of Gregor be withdrawn.

Documents Cited But Not Relied Upon For This Office Action

Applicants need not respond to the assertion of pertinence stated for the references cited but not relied upon by the Office Action, because these references are not made part of the rejections in this Office Action. Applicants are expressly not admitting to this assertion and reserve the right to address the assertion should it form part of future rejections.

Conclusion

Applicants respectfully submit that claims 1-10 and 28-40 are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney Walter W. Nielsen at 602/298-8920 or the below signed attorney to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

KISHORE K. CHAKRAVORTY ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH,
P.A.

P.O. Box 2938

Minneapolis, MN 55402

(612) 349-9592

Date

August 8, 2002

By

Ann M. McCrackin

Ann M. McCrackin

Reg. No. 42,858

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 8 day of August, 2002.

Jane E. Brockschink

Name

Jane E. Brockschink
Signature